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WATTS, C. H. S. WATTS 1988. Revision of Australian Halipilidae (Coleoptera). *Rec. S. Aust. Mus.* **22** (1): 21–28.

The Australian halipilids are revised. All belong to the genus *Haliplus*. Eight species are recognised, four of which are new: *H. alastairi* sp. nov, *H. nicholasi* sp. nov, *H. stepheni* sp. nov. and *H. sindus* sp. nov. The synonymy of *H. australis* Clark with *H. testudo* Clark 1985 is confirmed. A key to species is provided and relationships between species briefly discussed.

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The Australian Halipilid fauna is small with only eight known species. All belong to the worldwide genus *Haliplus*. Halipilids can be recognised from all other Australian aquatic Coleoptera by the large post-coxal plates which cover the bases of the hind legs. They are found among aquatic vegetation in still water around the coast from Adelaide eastward to Darwin. In addition, two species occur in the south-west of Western Australia and one in Tasmania. No specimens are known from the north-west. Both adult and larval stages are aquatic. No larvae of Australian species have been described. They are rare in collections and although I think this is to some degree a reflection of collecting pressure it is clear that they are not abundant. Structurally, Australian *Haliplus* fall into two clear groups. One, consisting of *H. fuscatus*, *H. gibbus* and *H. bistriatus*, is characterised by relatively small size, grooved pronotal process, well marked pronotal plicae with a depressed area between them, interstrial punctures absent or subobsolete, and a relatively narrow head. The other group, *H. testudo*, *H. alastairi*, *H. stepheni*, *H. nicholasi* and *H. sindus*, have a flat pronotal process, no pronotal plicae, no depressed area at back of pronotum and have a moderate number of punctures in most interstriae. The only major taxonomic work on Australian halipilids is that of Clark (1862) who described four species from south-eastern Australia. Regimbart described two New Guinean species in 1899 and Wehncke described *H. bistriatus* from Adelaide in 1880. The collections from which specimens were examined are listed under the following abbreviations:

AM	Australian Museum, Sydney
ANIC	Australian National Insect Collection
BMNH	British Museum (Natural History), London
CW	Private Collection of Author
MCZ	Museum of Comparative Zoology, Harvard
EUQ	Entomology Department, University of Queensland.
NMV	National Musuem of Victoria
NTM	Northern Territory Museum
SAMA	South Australian Museum
QM	Queensland Museum
QPI	Queensland Department of Primary Industry, Mareeba

Systematics

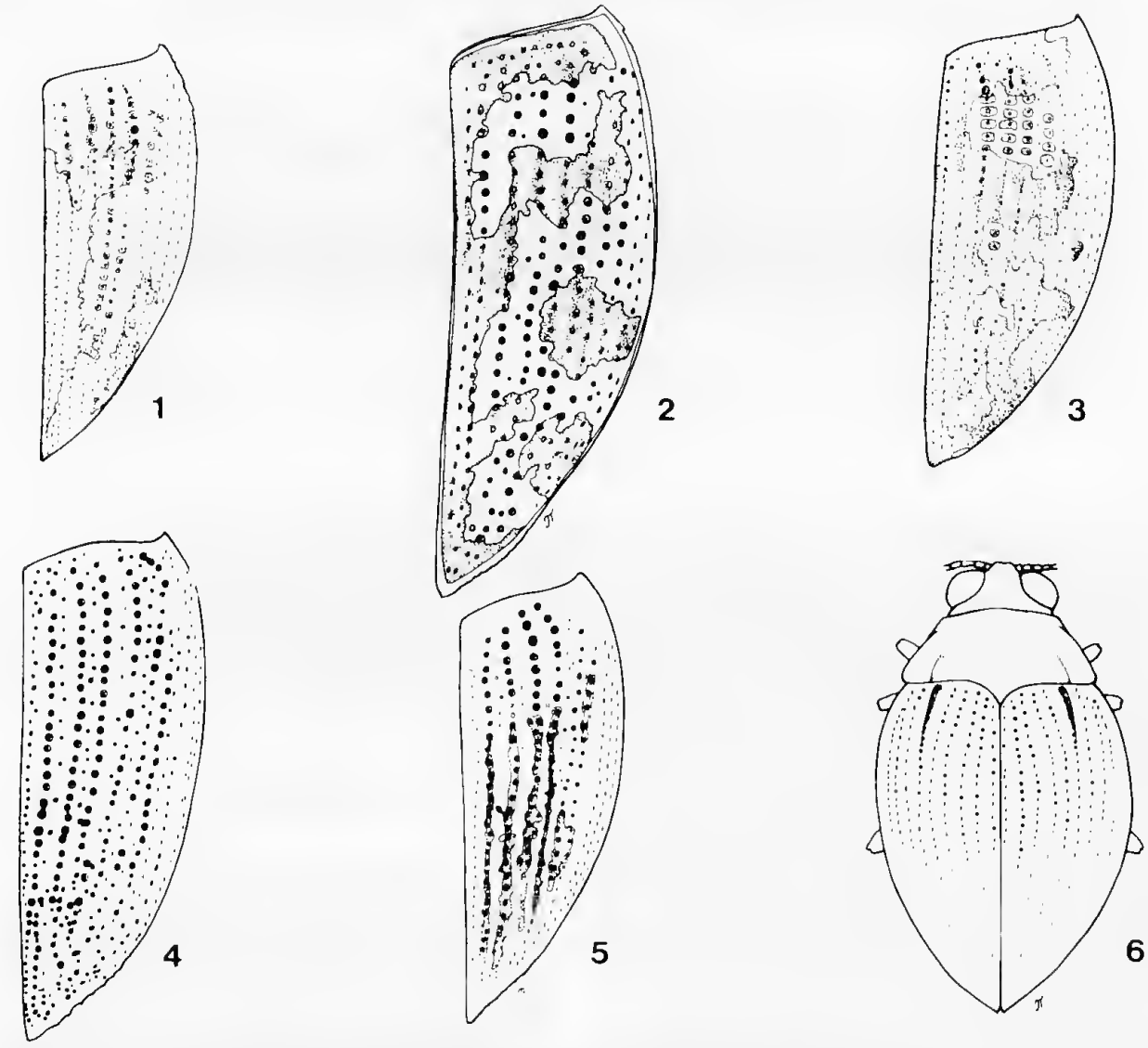
Key to Australian *Haliplus*

1. Pronotum with short to moderate plicae (Fig. 6), area between plicae depressed; pronotal process grooved; interstrial punctures lacking or subobsolete 6
   Pronotum lacking plicae, hind portion not depressed; pronotal process flat; interstrial punctures sparse but well marked 2

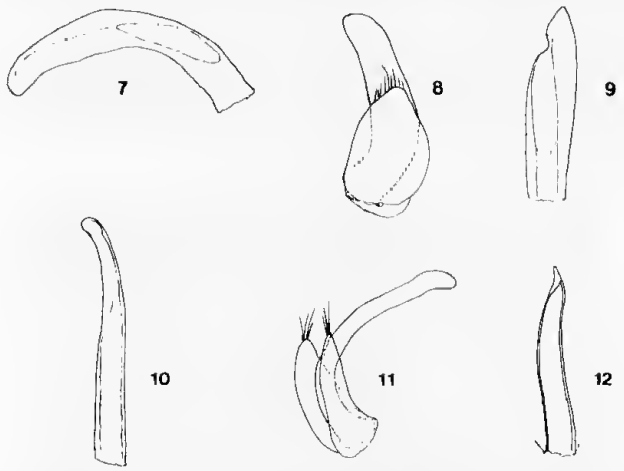
2. (1)<2.5 mm long; upper surface uniformly yellow-brown..... *sindus* sp. nov.
   >2.5 mm long; elytron usually with dark spots or markings 3

3. (2)Punctures and striae over most of elytron except laterally black, first interstria yellow-brown for most of its length (Figs 4 & 5). Elytral plicae weak, often reduced to 2–3 deeply impressed punctures..... *testudo* Clark
   First interstria of elytron black for most of its length; rest of elytra patterned as in Figs 1–3. Elytral plicae absent or short but well marked 4

4. (3) Elytral plicae short but well marked, elytron pattern as in Fig 3..... 5
   Elytral plicae absent; elytron pattern as in Fig. 3 ..... *nicholasi* sp. nov.



FIGURES 1–6. 1, Colour pattern on elytron of *H. alastairi*; 2, ditto *H. stepheni*; 3, ditto *H. nicholasi*; 4 & 5, ditto, *H. testudo* extreme examples; 6, dorsal view of *H. bistriatus* showing elytral and pronotal plica.



FIGURES 7–13. 7, Lateral view of aedeagus of *H. alastairi*; 8, dorsal view of aedeagus of *H. gibbus*; 9, dorsal view of aedeagus and paramere of *H. gibbus*; 10, ditto *H. alastairi*; 11, lateral view of aedeagus and paramere of *H. fuscatus*; 12, lateral view of aedeagus and paramere of *H. fuscatus*.

5. (4) 1–5 punctures in first interstria of elytron, 0–1 in third. Elytron without dark markings along anterior margin (Fig. 2) ..... *stepheni* sp. nov.
10-20 punctures in first interstria of elytron, 3–7 in third. Elytron without dark markings along anterior margin (Fig. 1) ..... *alastairi* sp. nov.

6. (1) Elytral plicae moderately-well marked; pronotal plicae curved (Fig. 6)..... *bistriatus* Wehncke
Elytral plicae absent or virtually so; pronotal plicae straight 7

7. (6) Aedeagus broad (Figs 8 & 9) ..... *gibbus* Clark
Aedeagus narrow (Figs 11 & 12)... *fuscatus* Clark.

Haliplus sindus sp. nov.

Description (number examined 2)

Length 1.7–2.4 mm. Yellow-brown. Oval, broadest at shoulders, narrowing rather abruptly at apex. Elytron

weakly and broadly triangularly flanged about one quarter way from apex, tip sharply pointed, weakly serrated at shoulder. Head with scattered punctures about size of eye facets. Pronotum wider behind than in front, sides weakly convex when viewed from above, with scattered large punctures, hind margin produced backwards in a small nearly equilateral triangle in midline. Elytron smooth, shiny, with well marked strial punctures, stronger laterally, sutural stria small but distinct, a very few scattered interstrial punctures except in interstriae three–four and five–six which lack punctures. Elytral plicae short, crescent shaped, well impressed. Pronotal process flat, wider slightly behind, with large scattered punctures. Front portion of mesosternum weakly concave, broader than pronotal process with sides sharply undercut with scattered well marked punctures, sides of mesosternum with a few very large punctures, much smaller in midline. Coxal lobes more densely covered with punctures, large towards sides to very small in midline.

Types

Holotype, sex unknown. Qld 'Bentinck Is. "Ninyilki" 6th June, 1963. P. Aitken, N.B. Tindale', in SAMA. Paratype F,1, 'Homehill Qld. 7.4.63 C.W.' in CW.

Distribution (Fig. 14)

Known only from the type localities.

Remarks

The small size and lack of pronotal plicae readily separate this rare species from other Australian *Haliplus*. It does not appear to be closely related to any other Australian species.

Haliplus nicholasi sp. nov.
(Fig. 3)

Description (number examined 4))

Length 3.3 – 4.1 mm. Oval, broadest at shoulders. Elytron only weakly tapering until final one third; apical one quarter weakly flanged and serrated; humeral angles weakly serrate. Head relatively broad between eyes; red-brown with scattered punctures about the size of eye facet; punctures at rear larger. Pronotum wider behind than in front, sides evenly diverging or slightly concave; strongly punctured particularly around margins, with an almost impunctate transverse band acrosspronotum behind middle; hind margin broadly triangularly produced in midline; reddish-brown. Antenna short, reaching to just behind middle of pronotum, five apical segments larger than rest, apical segment twice length of penultimate. Elytron reddish-brown with extensive black markings. Strial punctures on elytron large laterally, progressively weaker toward suture. Sutural punctures well marked, a little larger and much more numerous than those between stria one and two. Interstrial punctures small, sparse, absent from interstriae three to four. Elytral plicae absent, position marked by row of three or four punctures. Pronotal process flat, widening slightly toward rear, with scattered well marked punctures of varying size. Front section of mesosternum flat, not bordered by raised margin but margins sharply undercut; wider than pronotal process; punctured as on pronotal process; sides moderately covered with large punctures, much smaller towards midline. Coxal lobes more densely covered with punctures, those towards sides smaller than on sides of mesosternum, those towards midline about same size. Abdominal segments with one or two transverse bands of small to moderate punctures, apical segments with a few large punctures. Underside reddish-brown, legs a little darker.

Male: Protarsi a little exposed.

Types

Holotype, F 'Townsville, Qld. Feb 1972 T. Ingeldew', in NMV. Paratypes, 1 M, 'Homehill Qld. 7.4.63 CW', 2FF. 'Cairns Qld. 16.4.63 CW' in CW.

Distribution

Fig. 14. Known only from the type localities near Cairns and Townsville in North Queensland.

Remarks

A little known species, resembling the widespread *H. testudo*. It is slightly smaller, has fewer interstrial punctures, and differently patterned elytra. The aedeagus of the only known male specimen has been lost. The pattern on the elytra resembles in some respects that in *H. signatipennis* Regimbart from new Guinea. *H. nicholasi* differs from this species (and from the other known new Guinea species, *H. ferruginipes* Regimbart) in lacking punctures between stria three and four, and in lacking the transverse depression at the base of the pronotum present in these species.

Haliplus testudo Clark
(Figs 4 & 5)

Haliplus testudo Clark, 1862, p. 400
Haliplus australis Clark, 1862, p. 400. Syn. after Watts, 1985 and re-examination of types.

Types

H. testudo. Lectotype, F. right hand specimen of two mounted on card. No locality, previously with BMNH type and syntype labels, here designated. Companion specimen designated paralectotype. *H. australis*. Lectotype, F. no data except hand written BM label, previously with BMNH type and syntype labels, here designated.

Description (number examined 118)

Length 3.2 – 4.1 mm. Oval, widest at shoulders, tapering towards apex of elytra, lateral margin of elytron serrate in apical one quarter. Head relatively broad between eyes, yellow to yellow-brown, moderately covered with punctures about same size or slightly larger than facets of eye. Antenna stout, reaching over half way back on pronotum, apical five segments noticeably larger than rest, apical a little longer than penultimate. Pronotum relatively short, wider behind than in front, lateral margins evenly diverging or slightly bowed out when viewed from above; unevenly covered with scattered moderate to large punctures which are densest around margins, with an almost impunctate band across pronotum behind middle; hind margin with small but well marked backward extension in midline; yellow to yellow-brown, some punctures particularly towards rear outlined in black. Elytron yellow to yellow-brown, punctures and usually stria also black. Strial punctures well marked, a little larger than those on pronotum, those in striae one to three smaller than others. Sutural punctures small but quite dense and well impressed, about size of those in interstria one to two. Interstrial punctures numerous, one third to half size of ones in striae, absent or very sparse in area between suture and first stria, alternate interstriae starting between striae three and four have fewer punctures with the more lateral ones virtually impunctate. Elytral plicae absent or represented by two to three enlarged sometimes contiguous punctures in stria five. Pronotal process broad, flat, diverging slightly behind, with well marked lateral ridges, sparsely punctured. Mesosternum sparsely punctured, punctures large, laterally subobsolete in midline; well-marked ridges running backwards from pronotal process for about half length of segment. Coxal lobes large, strongly punctured laterally, weakly in midline. Abdominal segments with one or two transverse rows of small punctures. Apical segments with some moderate to large punctures in apical half. Underside yellow-brown with darker motlings particularly at bases of legs.

Male: Basal two joints of protarsi a little expanded.

Variation: Some specimens reddish all over.

Distribution: (Fig. 14)

Coastal regions from Darwin to Melbourne. Also from Charleville, Qld.

Remarks

By far the commonest and most widespread Australian halipilid. A variable species with yellowish specimens predominating in the south and darker reddish specimens in the north. In some southern specimens the characteristic black pigment around elytral punctures and striae is greatly reduced (Fig. 4). In some there are vague darker patches on the elytron suggestive of *H. alastairi* or *H. nicholasi* but in all specimens that I have seen the dark elytral striae have been separated by yellow-brown. In all but a few examples the elytral plicae are virtually absent. The aedeagus is variable in lateral view, with some specimens, notably those from more southern localities, being much wider in the middle.Separable from the other species lacking pronotal plicae by characters mentioned under *H. alastairi* and *H. nicholasi*.

Haliplus alastairi sp. nov.
(Figs 1, 7, 10)

Description (number examined 16)

Length 3.0–3.6 mm. Oval, tapering quite rapidly behind shoulders. Humeral angle of elytron serrate, apical one quarter of elytron weakly flanged and weakly serrate. Head relatively broad between eyes, dark yellow-brown, moderately punctate; punctures larger than eye facets. Pronotum wider behind than in front; lateral margins evenly diverging when viewed from above; strongly punctured particularly around margins, with an almost impunctate band across pronotum behind middle and a row of three to six noticeably larger punctures above hind margin at each corner; hind margin with small sharply triangular extension in the midline; reddish brown. Antenna reaching beyond middle of pronotum, last five segments larger than rest, apical about 1.5x longer than penultimate. Elytron reddish brown, with dark-brown to black markings. Strial punctures will marked, about size of pronotal punctures, those in striae one to three smaller than others. Sutural punctures well marked, as large as and more numerous than punctures between striae one and two. Interstrial punctures rather sparse, about one quarter to one third size of those in adjacent striae, alternate interstrial starting from between striae three and four have fewer punctures with the more lateral ones impunctate. Elytral plicae short (three to four punctures long) but usually deeply impressed; punctures on humeral angle between plica and edge of elytron large and crowded. Pronotal process relatively narrow, flat, quite strongly punctured. Front portion of mesosternum a little wider than pronotal process, flat or even slightly convex, sides rounded, undercut but not ridged. Mesosternum rather sparsely punctured, punctures strong at sides, small but well-impressed in midline. Coxal lobes more densely but still only moderately covered with punctures, those at sides moderate, about size of those in stria on elytron, those towards midline small but well impressed. Abdominal segments with one or two transverse bands of moderate punctures, apical segment with a few larger punctures. Underside reddish with darker areas, particularly legs which are mainly dark red-brown.

Male: Two basal segments of protarsi a little expanded.

Variation: One specimen from Tambourine Mountain, Qld that I refer to this species has the elytral plicae reduced to short series of slightly enlarged punctures.

Types

Holotype, M. '12°36'S 132°52'E Magela Creek, N.T. 1 Km NNW of Mudginbarry HS. 25.v.73. Matthews & Upton' in ANIC. Paratypes: 1, 'Cardstone Qld 4-16. i-1966 K Hyde'. 1, 'Cooktown N.Q. 1/71 GB', 2, 'Katherine, N.T. at light. 9.ii.68 J.A.L. Watson', 1, 'King River, 2, 14°30'S.143°20' E.22.vi.68. F. Parker' all in ANIC. 1, 'Lake Buchanan Qld. 21°30'S 145°50'E B.Timms 25/9/83', in CW; 1, 'Cairns C.J.W.' in QM.

Distribution (Fig. 13)

The east coast of Cape York and the top end of the Northern Territory. If the specimen from Tambourine Mountain near Brisbane does belong to this species it may indicate a more extensive range down the Queensland coast.

Remarks

Morphologically close to *H. testudo*, *H. nicholasi* and *H. stepheni* but averaging smaller than the first two of these species (3.0 mm compared with 4.0 mm and 3.3 mm respectively) with a more spindle shaped and less parallel sided form. The elytral plicae are well marked in all the specimens I have seen whereas they are virtually absent in all but a few specimens of *H. testudo* and *H. nicholasi*. The larger number of interstrial punctures separate it from *H. stepheni*. The colour pattern on the elytron differs from these species. The aedeagus is very similar to that of *H. stepheni*. It is a little thinner in dorsal view to *H. testudo*.

Haliplus stepheni sp. nov.
(Fig. 2)

Description (number examined 13)

Length: 2.8–3.0 mm. Oval, tapering quite rapidly from about half way back on elytrae. Humeral angle of elytron serrate, apical quarter of elytron weakly flanged and weakly serrate. Head relatively broad between eyes, dark yellow-brown, shiny, moderately punctate, punctures larger than eye facet. Pronotum wider behind than in front; lateral margins evenly diverging when viewed from above except for extreme front portions; sparsely covered with large punctures, impunctate areas on disc, row of larger punctures along hind edge at each side, laterally depressed in middle near hind edge, hind margin with small triangular extention in the midline, coloured as on head. Antenna reaching nearly to elytron, last five segments larger than rest, apical about same length as penultimate. Elytron dark yellowish-brown, with well defined dark pattern (Fig. 2). Strial punctures well marked, about size of those on pronotum, those on disc smaller than others, sutural punctures numerous, well marked, about half the size of those in adjacent striae. Interstrial punctures small and sparce, those in alternate interstria starting from interstriae 1–2 very sparse, lateral areas impunctate. Elytron plica short, 3–6 punctures long, deeply impressed, punctures between plica and edge of elytron only a little longer than others and not particularly crowded. Pronotal process relatively narrow, flat, quite strongly punctured. Front portion of mesosternum a little wider than pronotal process, flat except for front edge which is sharply depressed, sides slightly undercut, sparsely punctured with a row of punctures on vertical surface along sides, center virtually impunctate. Coxal lobes more densely but still only moderately covered with punctures, those at sides about size of those in lateral elytral striae, those towards midline small but well impressed. Abdominal segments with one or two bands of small punctures, apical segment with a few larger punctures, underside reddish with darker areas, particularly legs which are mainly dark red-brown.

Male: Last five joints of antenna a little smaller.

Types

Holotype, M. 'AUSTRALIA, N.T. Humpty Doo, 6 km E., 9.ii-4. iii.1987. R.I. Storey' in SAMA. Paratypes same data, 8 in QPI, 2 in C.W.

Distribution

Known only from the type locality near Darwin, N.T.

Remarks

A strikingly marked species separated from *H. alastairi* and *H. nicholasi* by the extension of black markings along front margin of elytron. Some individuals also have a dark patch on the front edge of the pronotum in the midline. The presence of well marked elytral plicae distinguish it from *H. nicholasi* and the greatly reduced number of interstrial punctures from *H. alastairi*. The pronotum is more strongly folded than in the other species and there is a hint of a basal depression in some specimens. The aedeagus is very similar to that of *H. alastairi*. It is a little thinner in dorsal view to *H. testudo*.

Haliplus bistriatus Wehncke
(Fig. 6)

Haliplus bistriatus Wehncke, 1880, p. 72.

Types

None located. (They are not in BMNH nor Paris National Museum.)

Description (number examined 39)

Length 2.5–3.4 mm. Oval, sides of elytra subparallel in central half. Elytron weakly flanged in apical one quarter. Head relatively narrow; yellow-brown; sparsely covered with scattered small punctures about the size of eye facets. Antenna short, reaching to about middle of prothorax, apical five segments noticeably larger than rest, apical segment largest. Pronotum wider behind, sides weakly bowed outwards when viewed from above; hind margin widely triangularly produced backwards in middle; with well marked plica reaching one third way across pronotum, curving inwards; area between plicae depressed; strongly punctured, particularly at sides and at front; yellow-brown with front margin and area between plica darker. Elytron dark yellow-brown with striae, other than at sides, outlined in dark-brown to black. Striae composed of rather large well impressed punctures, those in inner two striae about half size of others. Interstrial area impunctate, sutural row of punctures sparse and very small. Elytral plica moderately marked, a little longer than pronotal plica. Pronotal process broad, with row of strong punctures along edges, concave in cross-section. Mesosternum raised in forward midsection, without lateral ridge but sharply undercut; front portion same width as pronotal process and slightly depressed in midline; midline with scattered small punctures, larger towards rear, lateral sections covered in many strong punctures. Punctures on coxal plate vary from very strong laterally to subobsolete in midline, largest slightly smaller than those at sides of mesosternum. Abdominal segments with small to moderate sized but well marked punctures; apical segment strongly punctured. Undersides dark yellow-brown with extensive dark mottlings.

Male: Protarsi a little expanded.

Distribution (Fig. 13)

Coastal Queensland from Brisbane to Cooktown.

Remarks

H. bistriatus appears to be relatively common in coastal Queensland where it is the only *Haliplus* with pronotal plicae and depressed basal area of pronotum. It is readily separated from the more southerly *H. gibbus* and *H. fuscatus* with which it shares these characters, by the larger and distinctly curved pronotal plicae and the presence of well marked, though short, elytral plicae. The aedeagus is distinctive. The type locality is given as Adelaide. In the absence of the type this must throw doubt on my identification of this Queensland species. However, the description fits this species particularly in the unique (in Australia) character of having both pronotal and elytral plicae. This species has also been recorded from New Caledonia by Fauvel (1883) whose specimens were identified by Wehncke.

Haliplus gibbus Clark
(Figs 8 & 9)

Haliplus gibbus Clarke, 1862, p. 400.

Type

H. gibbus, lectotype, M. with genitalia extracted, 'S. Aust. Bakewell 59/24', previously with BM(NH) type and syntype labels, in BMNH, here designated.

Description (number examined 32)

Length 2.4–3.2 mm. Widely oval. Lateral edges of elytra parallel in central half. Elytron weakly flanged in apical quarter. Head relatively narrow, yellow-brown, sparsely punctured with small punctures about size of eye facet. Antenna short, reaching to about middle of prothorax, ten segmented, apical segment largest, next four subequal and noticeably larger than rest. Pronotum wider behind, sides smoothly diverging or slightly bowed except for hind corners where subparallel for short distance, hind margin widely triangularly produced backwards in middle, well marked sharp plicae to one quarter to one third width of pronotum, subparallel or weakly converging, positioned in line with front corners of pronotum, area between plicae depressed, moderately punctate, punctures uneven in size and distribution small on disc large at sides, yellow-brown, with front margin and area between plica often darker. Elytron yellow-brown with striae on disc outlined in dark-brown or black, some specimens with vague darker patches on elytron, nine elytral striae composed of moderately impressed punctures, those on inner two or three striae weaker, interstriae impunctate, sutural punctures sparse, very small, elytral plicae absent but punctures at front of stria five close together and often with their lateral margins accentuated. Pronotal process broad, margins ridged, concave in cross section. Mesosternum raised, weakly longitudinally depressed on forward midsection, front corners wider than adjacent pronotal process with distinct tendency to be bulbous and delineated from rest of mesoternum by fine line running backwards for about half length of segment. Lateral lobes of mesoternum with a few very large punctures, midline with subsolete to moderate punctures, larger behind. Coxal lobes strongly punctured laterally, weakly so towards midline. Undersde yellow-brown often with considerable brown-black areas, paerticularly pronotal process, lateral areas of mesosternum, first three abdominal segments ane parts of legs. Abdominal segments weadly punctured except apical one which has a few stronger ones.

Male: Protarsi weakly expanded.

Distribution (Fig. 13)

The wetter areas of southern W.A., S.A., Victoria and Tasmania. A southern species. Populations of either

this species or *H. fuscatus* or some very similar species are also known from Lake Gailee in Central Queensland and near Katherine in the N.T. Unfortunately these are only represented in collections (CW & SAMA) by females so their taxonomic status is uncertain.

Haliplus fuscatus Clark
(Figs 11 & 12)

Haliplus fuscatus Clark 1862, p. 400.

Type

H. fuscatus, Holotype, F, no data, in BMNH, locality given as Adelaide by Clark.

Description (number examined 13)

As for *H. gibbus* except for the aedeagus which is much narrower.

Distribution (Fig. 13)

Victoria, S.A. (type) and Rottnest Island, W.A.

Remarks

Does not appear to be as common as *H. gibbus*, nor as widespread. I have been unable to separate this species from *H. gibbus*. Although only known for certain from Rottnest Island, W.A. and Victoria, further collecting will undoubtedly extend its known distribution (See also note under *H. gibbus*). The type of *H. fuscatus* is a female and as such I cannot assign it to either of the two species of southern Australian *Haliplus* with weak or absent elytral plicae and straight pronotal plicae. Future studies may well show that *H. fuscatus* is a synonym (senior) for *H. gibbus* and that the species described above as *H. fuscatus* is new. In a previous publication (Watts 1985) I listed *H. fuscatus* and *H. gibbus* as synonyms since I was unable to separate the types.

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FIGURE 13. Distribution map of *H. fuscatus, H. bistriatus, H. alastairi* and *H. gibbus.*

FIGURE 14. Distribution map of *H. sindus, H. testdo, H. nicholasi* and *H. stepheni.*